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KEYNOTE ADDRESS

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Moving Business Excellence in Malaysia; Strategic Enables & Actions Under - IR 4.0 Initiatives - The Framework.

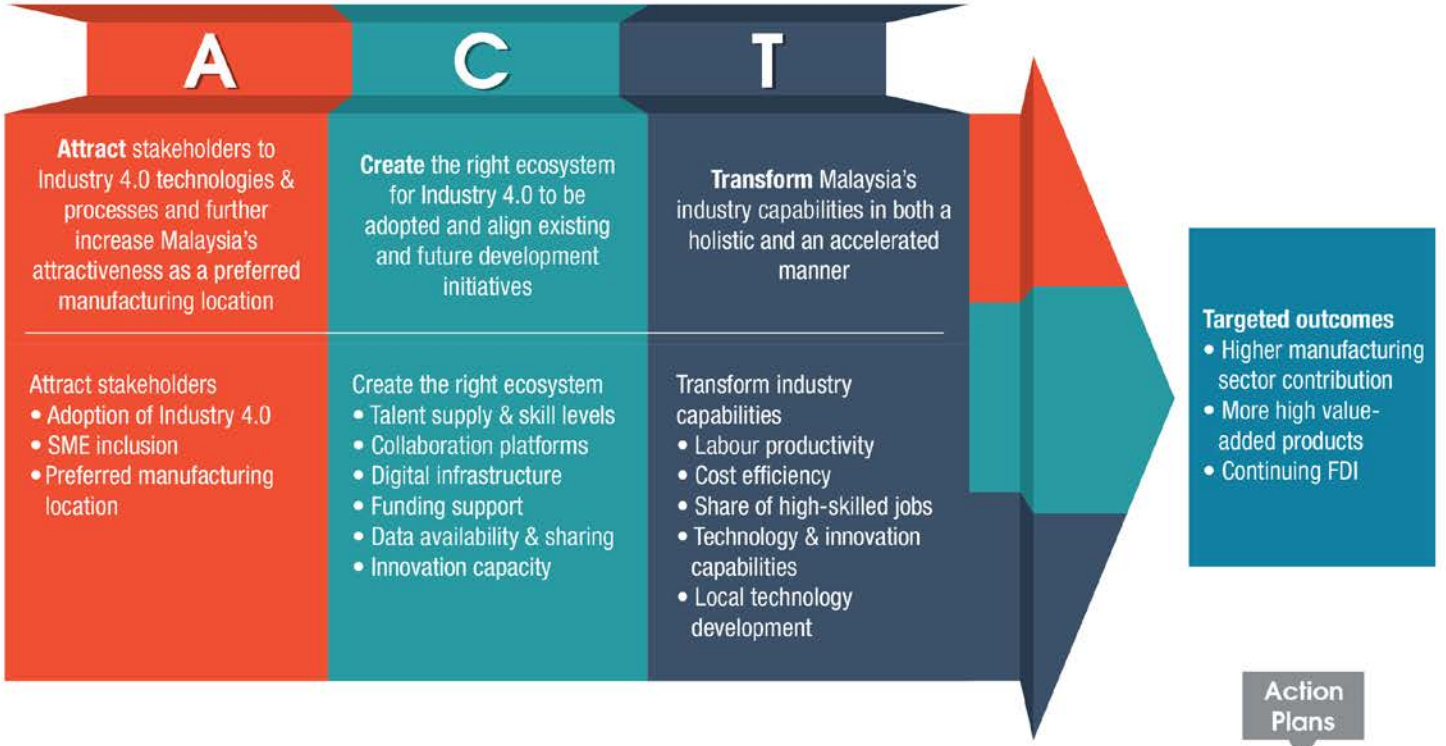
POLICY
OBJECTIVES

Already, a number of initiatives and organisations have been established at the national, state and regional level by both the Government and industry to develop plans and actions to strengthen various manufacturing industries. This support for and focus on manufacturing firms are important and create a strong platform. However, these programs have largely been developed independently and often have overlapping objectives and industry audiences.

There is a need for a more streamlined and cohesive national agenda under which these initiatives and organisations can be integrated to accelerate Malaysia's transformation into a smart and modern manufacturing system. This will also include the need for a greater alignment across government, research and academia regarding priority industries, specific goals, enabling actions, and their funding. Countries like Germany and Japan provide examples of best practices where government, research and academia are tightly integrated with the manufacturing industry through collaborative Public Private Partnerships (PPP) that develop innovative solutions for specific industry needs.

With this in mind, Malaysia has put in place the National Industry 4.0 Policy Framework – My-i4.0 – that provides a concerted and comprehensive transformation agenda for the manufacturing sector.

THE OBJECTIVES OF THE INDUSTRY 4.0 POLICY ARE THREEFOLD – ACT:



NATIONAL FRAMEWORK BY THE NUMBERS

THE NATIONAL FRAMEWORK

My-i4.0

The Vision

Malaysia's **vision** for the manufacturing sector in the next 10 years

- Strategic partner for smart manufacturing & related services in Asia Pacific
- Primary destination for high tech industry
- Total solution provider for advanced technology

The National Goals

Specific **goals** to guide and measure the progress of transformation

- Labour Productivity Growth
- Manufacturing Contribution to Economy
- Innovation Capacity
- High Skilled Jobs

The Shift Factors

A set of **shift factors** that need to be optimised in a balanced manner

The Enablers

Specific **enablers** that determine the strategies, policies and action plans

ENVISIONING
THE FUTURE OF MALAYSIAN MANUFACTURING INDUSTRY

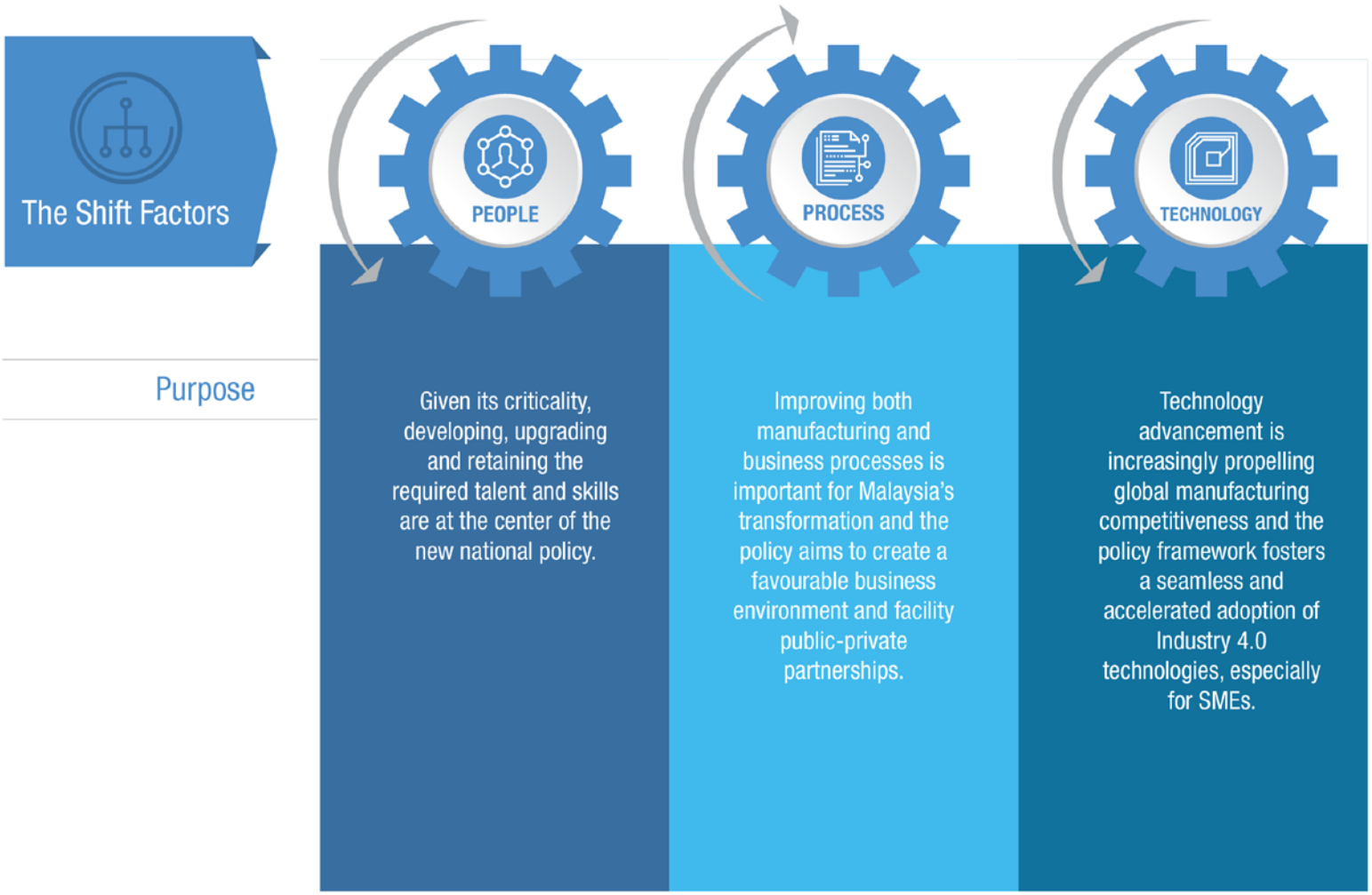
The development of these visions is made in full realisation that there is a need to transform the manufacturing industry to embrace Industry 4.0. This is due to the fact that global trends point towards the ability to master and adopt to the new technology development will which will then drive Malaysian towards greater competitiveness.

National vision for Malaysia's manufacturing sector in next 10 years

Visions Strategic partner for smart manufacturing and related services in Asia Pacific	**Rationale** Ensure continued relevance and importance for Malaysia in global & regional production value chains
Visions Primary destination for the high-tech industry	**Rationale** Remain preferred manufacturing location for leading global and regional players
Visions Total solution provider for advanced technology	**Rationale** Create a holistic ecosystem that propels Malaysia's transformation and helps SMEs break out and scale up

SHIFT FACTORS

Malaysia's transformation will require an approach and ecosystem that optimises and balances the relationships between people, processes and technology. Industry 4.0 adoption will only be as good as the processes that are implemented around it, and the processes are only as good as the people who execute them.



To bring the shift factor gears together and achieve optimal results, a well-coordinated orchestration and top-level driven implementation will be important.

NATIONAL GOALS & TARGETS

The specific goals and targets are in support of the national vision for the transformation of the manufacturing industry. They guide and measure Malaysia's progress in improving productivity, strengthening the innovation capacity and capabilities, driving the shift to a higher skilled workforce, and expanding the overall contribution of the manufacturing sector to the national economy.

To increase the level of productivity in the manufacturing sector;

To elevate the contribution of the manufacturing sector to the economy;

To strengthen our innovation capacity and capability, reflected in the global innovation ranking; and

To increase the number of high-skilled workers employed in the manufacturing industry

The targets for the goals are developed from the 2016 baseline figures:

Productivity of the manufacturing industry per person	Absolute **contribution in Ringgit Malaysia (RM) term from the manufacturing sector** to the national economy	Global Innovation **Index ranking**	Numbers of **skilled workers employed in the manufacturing sector**
From **RM106,647** To increase by **30%**	From **RM 254** billion To **RM 392** billion	From **#35** To top **30** nations	From **18%** to **50%**

THE STRATEGIC ENABLERS

The Strategic Enablers F.I.R.S.T

Funding

Funding & Outcome - Based Incentives

The funding strategies are aimed at encouraging companies to adopt new manufacturing technologies and processes and invest in R&D, specifically to develop local solutions targeted at Malaysia's needs and priorities. Special attention will be given to collaborative efforts in developing and deploying Industry 4.0 technologies.

Infrastructure

Enabling Ecosystem & Efficient Digital Infrastructure

Service providers will play an essential role in helping Malaysian companies accelerate their transition to Industry 4.0, particularly in developing people, transforming processes and adopting technologies. As such, involving service providers and linking them to manufacturing firms, especially SMEs, is important to create a holistic and effective Industry 4.0 ecosystem.

THE STRATEGIC ENABLERS

Regulations

Regulatory Framework & Industry Adoption

Regulation is a key enabler of Malaysia's Industry 4.0 transformation. Special emphasis will need to be on increasing the awareness of the need and benefits of adopting Industry 4.0 technologies and processes. This is particularly important for SMEs who still have a limited understanding of digital and Industry 4.0 and often are concerned about the cost and level of change required.

Skills & Talent

Upskilling Existing & Producing Future

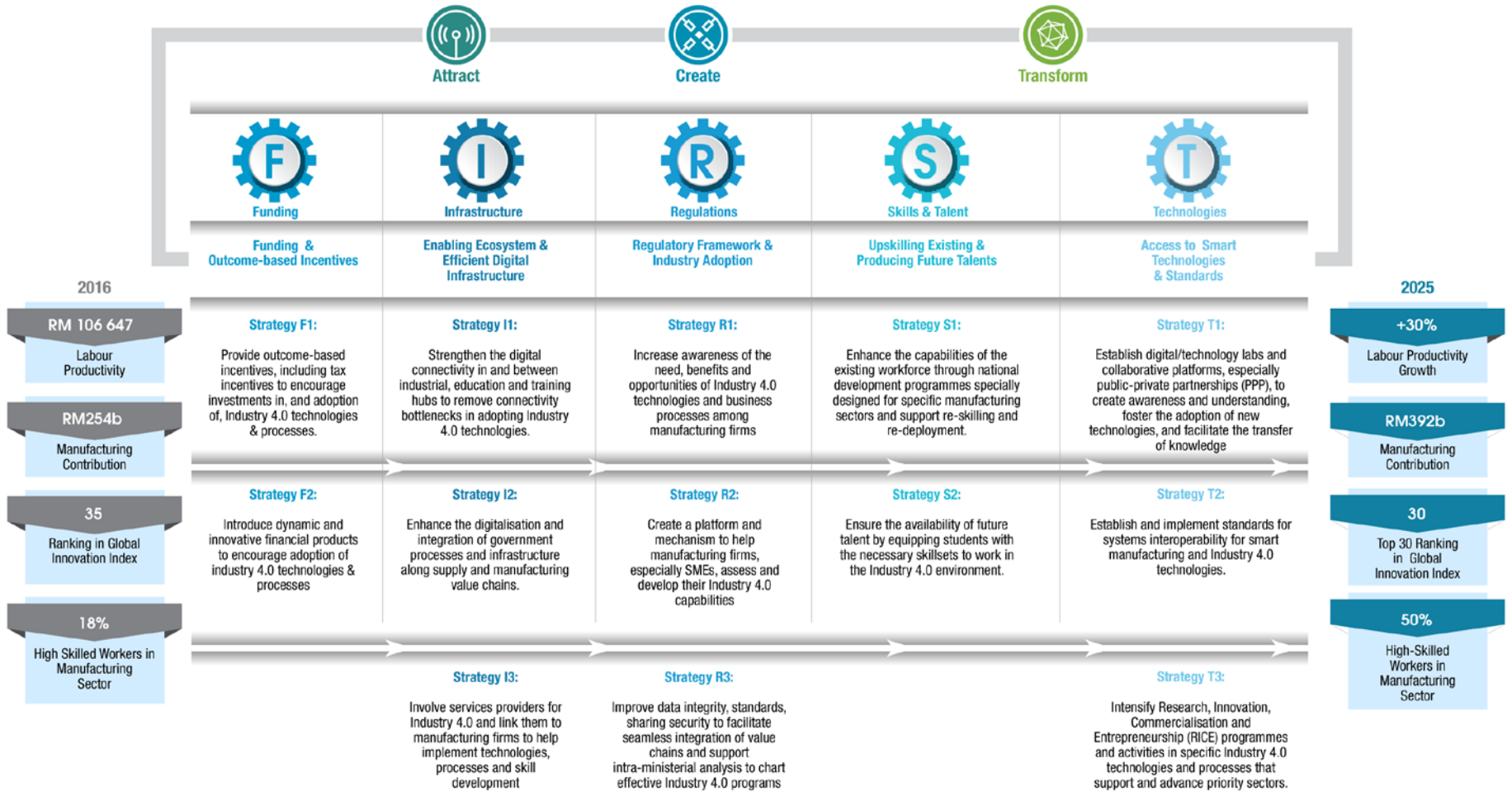
There is an urgent need to create a skilled and diverse workforce, with high salary, both by up-skilling the existing labour pool and by attracting and developing future talent in the manufacturing sector. Particular attention also needs to be given to re-skilling and re-deploying lesser skilled workers to other sectors and activities.

Technologies

Access to Smart Technologies & Standards

Finally, developing and commercialising new technologies and processes that address specific needs in priority sectors will be crucial to retain Malaysia's position as a preferred high tech and manufacturing hub and supply chain partner.

THE NATIONAL STRATEGIES



FUNDING & OUTCOME-BASED INCENTIVES

Provide outcome-based incentives, including tax incentives to encourage investments in, and adoption of, Industry 4.0 technologies & processes.

RATIONALE

The Government aims to support industry transformation and develop local technology development by providing and aligning incentives with targeted outcomes to manufacturing firms and solution providers.

STRATEGIC OUTCOMES

- Fiscal and non- fiscal incentives for local firms, SMEs and start-ups as well as multi-national corporations (MNCs) that deploy or develop Industry 4.0 technologies and processes.

ACTION PLANS/PROGRAMMES

- To explore on realigning and leveraging incentive packages to encourage the adoption of Industry 4.0 among local firms, especially SMEs
- To explore on providing incentive packages to MNCs partnering with local firms, especially SMEs, to expedite the adoption and implementation of Industry 4.0

FUNDING & OUTCOME-BASED INCENTIVES

Introduce dynamic and innovative financial products to encourage adoption of industry 4.0 technologies & processes

RATIONALE

In fulfilling the needs of diverse and innovative businesses, the Government and private sector will spur the implementation of Industry 4.0 through dynamic and innovative funding options for local firms, SMEs and start-ups as well as multi-national corporations (MNCs).

STRATEGIC OUTCOMES

- A suite of comprehensive financial products that local firms, SMEs and start-ups as well as multi-national corporations (MNCs) can leverage on in line with their needs in implementing and adopting Industry 4.0 technologies and processes, across all stages of business life-cycle
- Development funds for adoption, development or deployment of Industry 4.0 technologies and processes

ACTION PLANS/PROGRAMMES

- To explore on creating Government-led development funds for Industry 4.0.
- To create awareness among local firms on the availability of various financing options to expedite the adoption and implementation of Industry 4.0 and encourage hybrid purchase or service arrangement for B2B in their financing agreements.
- To explore on aligning existing alternative financing including venture capital, crowd funding and other intermediaries to expedite the adoption and implementation of Industry 4.0.

ENABLING ECOSYSTEMS & EFFICIENT DIGITAL INFRASTRUCTURE

11 STRATEGY

Strengthen the digital connectivity in and between industrial, education and training hubs to remove connectivity bottlenecks in adopting Industry 4.0 technologies.

RATIONALE

Fast and secure data connection is a basic requirement for the realisation of Industry 4.0. technologies and services. Malaysia already has deployed High Speed Broadband and 4G technologies on a wide-spread basis, but there are still some gaps in key industrial and training locations that could impact the adoption and development of Industry 4.0 technologies and processes.
The strategy aims to systematically address and remove key connectivity bottlenecks in priority locations.

STRATEGIC OUTCOMES

- Ensuring high speed and reliable connectivity for industrial, education and training hubs
- Enabling adoption of digital and Industry 4.0 technologies and processes among manufacturing firms and related service providers

ACTION PLANS/PROGRAMMES

- To prioritise and expedite the implementation of High Speed Broadband (HSBB) at key industrial areas and training centres
- To encourage the deployment of converged networks that are essential for Industry 4.0 technologies, especially IoT

ENABLING ECOSYSTEMS & EFFICIENT DIGITAL INFRASTRUCTURE

12 STRATEGY

Enhance the digitalisation and integration of government processes and infrastructure along supply and manufacturing value chains.

RATIONALE

Digitalising and integrating government processes and infrastructure elements along value chains will be key to enable secure data flows, assure seamless goods movements, and drive improvements in efficiency and productivity.

A number of government processes are not yet digitalised and will need to be optimised, digitalised and integrated to support Malaysia's Industry 4.0 transformation. These include certain approval, licensing, certification, good clearance and other processes.

STRATEGIC OUTCOMES

- End-to-end digitalisation of government processes along the manufacturing and supply industry value chains
- Seamless movement of goods and services between manufacturers, suppliers and supporting agencies with improved visibility and optimised resourcing

ACTION PLANS/PROGRAMMES

- To assess priority government-related processes and elements that impact manufacturing and supply chains and Industry 4.0 transformation
- To support the accelerated digitalisation and integration of these processes, led by the respective government agencies

ENABLING ECOSYSTEMS & EFFICIENT DIGITAL INFRASTRUCTURE

Involve services providers for Industry 4.0 and link them to manufacturing firms to help implement technologies, processes and skill development.

RATIONALE

Services related to Industry 4.0 are an important element to help Malaysian companies accelerate their transition to Industry 4.0, especially in developing people, transforming processes and adopting technologies.
Hence, Industry 4.0 service providers need to be involved as an integral part of the ecosystem and be connected to manufacturing firms, especially SMEs, who often have limited visibility.

STRATEGIC OUTCOMES

- End-to-end ecosystem support and service provider visibility for manufacturing firms
- Improved performance of services providers in helping manufacturing firms adopt and transform to Industry 4.

ACTION PLANS/PROGRAMMES

- To develop and disseminate a catalogue of service providers
- To link service providers to manufacturing firms and SMEs through collaboration platforms

REGULATORY FRAMEWORK & INDUSTRY ADOPTION

Increase awareness of the need, benefits and opportunities of Industry 4.0 technologies and business processes among manufacturing firms

RATIONALE

Lack of awareness of digital and Industry 4.0 is one of the main issues and barriers to embark on the smart manufacturing transformation.
A greater understanding of Industry 4.0 is crucial for manufacturing firms to make informed decisions on investments, especially on assessing impact, determining cost and benefits of automation, and capitalising on data.
Structured awareness programs are needed to educate and promote the understanding and need for action to local firms and particularly SMEs.

STRATEGIC OUTCOMES

- Increased understanding of the need, benefits and opportunities of Industry 4.0
- More manufacturing firms adopting Industry 4.0 technologies and processes

ACTION PLANS/PROGRAMMES

- To undertake a comprehensive Industry 4.0 awareness programme across all stakeholders with particular focus on SMEs
- To create a regulatory sandbox that enables firms to manage regulatory risks during the testing stage.

REGULATORY FRAMEWORK & INDUSTRY ADOPTION

Create a platform and mechanism to help manufacturing firms, especially SMEs, assess and develop their Industry 4.0 capabilities

RATIONALE

For many companies, Industry 4.0 will be a major transformation, not only by investing in technology, but also by changing business processes and culture. The experiences of other countries show that assessment tools and platforms for learning and best practice sharing help companies, especially SMEs, pinpoint priorities of not only what to address, but also how to transform.

Implementing this strategy will require a close collaboration with the different industry associations to ensure focus on the right sector priorities. This strategy will also help the Government assess better the broader needs, challenges and priorities of Malaysian manufacturing firms.

STRATEGIC OUTCOMES

- Better understanding among manufacturing firms of best practices, their own capabilities and transformation requirements
- Profile of the state of readiness of the local manufacturing industry in adopting Industry 4.0 for targeted technology improvement and support prioritisation

ACTION PLANS/PROGRAMMES

- To create tools and processes to help manufacturing firms assess their capabilities and readiness to adopt Industry 4.0 technologies and processes
- To establish a national Conformity & Industrial Assessment as a platform for conducting this assessment, sharing global and local best practices, supporting the development of local firms, and identifying national Industry 4.0 priorities
- To establish collaborative programs with other countries that are leading the Industry 4.0 transformation to share best practices and help guide Malaysia's programmes for optimal impact

REGULATORY FRAMEWORK & INDUSTRY ADOPTION

Improve data integrity, standards, sharing security to facilitate seamless integration of value chains and support intra-ministerial analysis to chart effective Industry 4.0 programs

RATIONALE

A significant barrier to enabling seamless digital flows along manufacturing and supply chains is the lack of standards, inter-operability and governance for both data and intellectual properties.
Issues with data integrity and inter-operability can also affect intra-ministerial coordination and effective analysis in identifying program and regulatory priorities.
This will require both the development of standards and security protocols and integration especially across government ministries and agencies.
This strategy supports strategy I2, the digitalisation and integration of government processes into manufacturing supply chains.

STRATEGIC OUTCOMES

- Integrated, standardised, secure and trusted data ecosystem that enables seamless data flows throughout major manufacturing and supply chains
- Better understanding and analysis of priority issues across initiatives, ministries and agencies, driving more effective programs and regulatory support

ACTION PLANS/PROGRAMMES

- To identify and implement effective and streamlined, standardised data, regulation and compliance protocols within and between government ministries and agencies
- To collaborate with businesses to ensure suitable standards are in place for privacy of data, including appropriate handling, ownership and storage
- To create a manufacturing industry data depository that will enable sharing and analyses across all government ministries and agencies
- To establish a set of cybersecurity and IoT security guidelines for Industry 4.0 as part of Malaysia's broader development of cybersecurity capabilities

UPSKILLING EXISTING & PRODUCING FUTURE TALENTS

Enhance the capabilities of the existing workforce through national development programmes specially designed for specific manufacturing sectors and support re-skilling and re-deployment.

RATIONALE

The transition to smart manufacturing business models, technologies and processes is rapidly changing the required skillsets for the existing workforce. Many firms, especially SMEs, will require more structured and up-to-date training and skill development avenues for developing and maintaining world-class practices and capabilities within their workforce, including experts with advanced Industry 4.0 knowledge.

This strategy aims to both upskill the existing workforce and mitigate the potential impact on jobs.

STRATEGIC OUTCOMES

- Increase in overall labour productivity due to upskilling and reskilling of the existing workforce
- Increase in number of high-skilled and multi-skilled workers with high wages in the manufacturing industry
- Mitigation of the number of potential job losses as a result of automation and technology adoption

ACTION PLANS/PROGRAMMES

- To create an Industry 4.0 Talent Competency & Technology Mentoring Programme to drive broader workforce development initiatives in line with specific sector requirements
- To establish an Expert Certification Programme in Industry 4.0 areas
- To develop tailored training courses for the re-skilling of transitioning employees
- To enhance classroom programs for rapid upskilling programs by using augmented or virtual reality (AR/VR)
- To enable the availability of data on Industry 4.0 talent and labour pools for the government, academia and industry (in order to chart future action plans)

UPSKILLING EXISTING & PRODUCING FUTURE TALENTS

Ensure the availability of future talent by equipping students with the necessary skillsets to work in the Industry 4.0 environment.

RATIONALE

Ensuring the pipeline of future talents in the manufacturing sector is important as advances in manufacturing techniques and processes require a higher skilled and educated workforce.
The focus on technical vocational education & training (TVET) and STEM (science, technology, engineering, mathematics) education will be of priority as this will ensure a continuous supply of highly qualified talent.
There is also a need to raise the profile of the high technology manufacturing industry and firms as attractive work and career places and employers of choice. This will be key to attract more students to STEM subjects.

STRATEGIC OUTCOMES

- Continuous availability of Industry 4.0 talents for the manufacturing industry
- Graduates equipped with relevant and practical Industry 4.0 skills
- Increased number of TVET & STEM students
- Increased industry-academia collaboration

ACTION PLANS/PROGRAMMES

- To boost support for TVET & STEM education programmes, in part by increasing funding for vocational education and training programmes
- To integrate theory and practical Industry 4.0 applications into tertiary education curricula, including structuring industry placement opportunities
- To promote manufacturing as a preferred destination for high-skilled jobs to overcome public perception issues and attract both skilled labour and university graduates
- To enhance and increase the capacity and capabilities of educators, trainers and instructors in the manufacturing related education sectors

ACCESS TO SMART TECHNOLOGIES & STANDARDS

Establish digital/technology labs and collaborative platforms, especially public-private partnerships (PPP), to create awareness and understanding, foster the adoption of new technologies, and facilitate the transfer of knowledge.

RATIONALE

Digital/technology labs by manufacturing leaders create showcases for local companies, especially SMEs, to understand available and best-in-class technologies, practical use cases, and engage in collaborative deployment efforts. Public-private partnerships (PPP) are proven concepts to help expedite the adoption of new technologies in priority areas. The Government intends to work with local and global leaders to establish more digital & technology labs and collaboration platforms through PPP arrangements.

STRATEGIC OUTCOMES

- Access for local companies, especially SMEs, to key enabling Industry 4.0 technologies and partners
- Stronger collaboration in deploying new technologies across value chains
- Public-private partnership platforms for industry, academia, government and other stakeholders to work for a targeted outcome in Industry 4.0

ACTION PLANS/PROGRAMMES

- To support leading global and local industry leaders to establish digital/technology labs that showcase the potential applications, benefits and proof of concept of new technologies for industry adoption
- To create public-private partnerships and collaborative programs for manufacturing activities that foster digital adoption, collaborative deployment and development of local capabilities, especially in priority sectors and technologies
- To provide SMEs and local firms with open access to smart manufacturing research, tools and technologies and help them understand what can be applied in the early stages of adoption

ACCESS TO SMART TECHNOLOGIES & STANDARDS

Establish and implement standards for systems interoperability for smart manufacturing and Industry 4.0 technologies.

RATIONALE

Standards and interoperability of systems are important to facilitate a wide-spread adoption of Industry 4.0 technologies and processes, especially given the need for collaboration and integration along manufacturing and supply chains. These standards need to be understood, well documented, and allow Malaysian-based manufacturing firms to integrate both within local and global production networks and supply chains.

STRATEGIC OUTCOMES

- Standardisation for interoperability of Industry 4.0 technologies and processes
- Seamless integration and interoperability in local and global manufacturing and supply value chains

ACTION PLANS/PROGRAMMES

- To establish an inventory of Industry 4.0 related standards – consolidate, develop, harmonise, align with global standards, and enact
- To address interoperability barriers by implementing appropriate and advanced industry standards, in close consultation with the industry

ACCESS TO SMART TECHNOLOGIES & STANDARDS

T3 STRATEGY

Intensify Research, Innovation, Commercialisation and Entrepreneurship (RICE) programmes and activities in specific Industry 4.0 technologies and processes that support and advance priority sectors.

RATIONALE

Growth opportunities in the manufacturing sector will need to be supported by technological innovation from both private and public research communities. Sustained growth in the manufacturing sector will require proactive investments in advancing and enabling Industry 4.0 technologies and processes.
A further step up in Malaysia's innovation capabilities will be important to propel priority sectors and technologies and reinforce Malaysia's position as preferred high-tech manufacturing destination.

STRATEGIC OUTCOMES

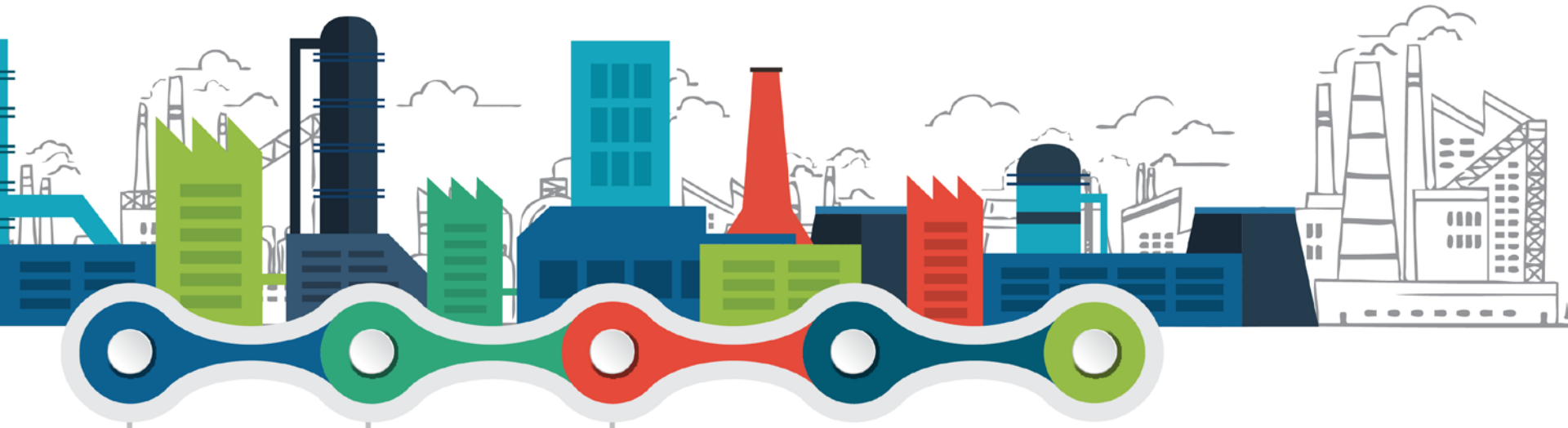
- Increase in capacity and capability of Malaysian firms, start-ups, universities and research institutes in Industry 4.0 technologies
- Production and commercialisation of high value and innovative products and services
- Position as primary destination for the high-tech industry

ACTION PLANS/PROGRAMMES

- To prioritise technology development programmes on Industry 4.0 that strengthen the overall research, innovation, commercialisation and entrepreneurship capacity and provide solutions for priority sectors
- To improve understanding by and access for manufacturing firms of existing Industry 4.0 research facilities and ongoing research and development
- To create technology development and experimentation labs for collaborative Industry 4.0 technology and solution development

IMPLEMENTATION APPROACH

The strategies and actions plan outlined in the previous pages require a collaborative effort across multiple stakeholders and organizations. To accelerate or improve the intended outcome of these actions, a number of factors must be taken into consideration to identify the most efficient and effective implementation approach. This includes but not limited to:



Multi-ministries jurisdictions
The strategies and action plans in this policy framework is a systemic solution for the manufacturing industry and its associated services.

Not a one stop solution
Although all efforts have been taken to incorporate all possible interventions, this policy framework is not a solution to all.

One size fits all – breadth and depth
This documents provides broad strategies and action plans. It is premised upon the principle that each sector within the manufacturing industry has different level of readiness in embracing and adopting to Industry 4.0. Further work is required to customise these recommendations for each sector depending on their needs and priorities.

Differentiating circumstances
In recognising the best practices among manufacturing ecosystems such as Germany and Japan, it is acknowledged that the needs and the driving factors of these countries are very much different from Malaysia's. An exact replication of their successful systems would not work that well in Malaysia's context due to these differences. As such, each manufacturing sector needs to consider which elements of these international benchmarks could be adopted.

Solutions for the SMEs
Majority of the manufacturing firms are SMEs. They typically have lower levels of collaboration with research, reduced access to high performing graduates, and less revenue to invest resources in strategic planning. However the agility and specialisation of SMEs will be critical in achieving the 10-year vision for the manufacturing sector. In implementing the suggested actions, it is important to ensure solutions are valuable and accessible to SMEs, and that the research community and larger businesses are greater incentivised to collaborate with SMEs.

Transforming Malaysia manufacturing sector is not a short-term process, with many industries having experienced significant challenges for decades. Regardless of the actions of the sector over the next few years, a supportive policy environment is required over the next decade to provide businesses with stability and allow them to execute these long-term strategies.